

Briefing

MEMORANDUM

July 19, 2016

TO: Transportation, Infrastructure, Energy & Environment (T&E) Committee
FROM: *KL* Keith Levchenko, Senior Legislative Analyst
SUBJECT: **Briefing:** WSSC Benchmarking Study

The following officials and staff are expected to attend this meeting:

County Government

- Bonnie Kirkland, Assistant Chief Administrative Officer
- Dave Lake, Manager, Water and Wastewater Management, Department of Environmental Protection
- Matthew Schaeffer, Management and Budget Specialist, Office of Management and Budget

Washington Suburban Sanitary Commission (WSSC)

- Fausto Bayonet, Commission Chair
- Howie Denis, Commissioner
- T. Eloise Foster, Commissioner
- Monica Johnson, Deputy General Manager for Strategic Partnerships
- Joseph Beach, Chief Financial Officer
- Crystal Knight-Lee, Team Chief of Customer Relations
- JC Langley, Team Chief for Plant Operations
- David Malone, Team Chief for Procurement
- Mujib Lodhi, Chief Information Officer
- Bryan Samuels, Director of WSSC Stat
- Mark Brackett, Acting Group Leader for Budget

Consultants

- Kent Nelson, Project Manager, Veolia
- Jonathan Carpenter, Business Development, Veolia
- Myron Olstein, Juggernaut Consulting Principal
- Jason Jennings, Juggernaut Consulting Principal

Attachments to this memorandum include:

- Washington Suburban Sanitary Commission Utility Benchmarking & Organizational Efficiency Review Montgomery County Briefing Slides (©1-32)¹
- National Trends – Rate Increases Since 2002 (©33)
- FY16 Residential Monthly Water/Sewer Bill Comparison (©34)
- Average Monthly Bill Comparison as a Percentage of Median Income (©35)

Background

In May 2015, as part of its action on the FY16 WSSC Budget, the Montgomery and Prince George’s County Councils agreed that WSSC should hire a consultant to perform a benchmarking study. The impetus for this study was concern over WSSC’s staffing increases and rate increases over the past decade (see further information below).

This study began in December 2015 and was completed this past June. Staffs from both counties and WSSC participated in a benchmarking review group, which met periodically with the consultant to receive milestone updates and provide feedback. The study included two major parts:

- 1) A high-level benchmarking effort looking at over 100 metrics and industry best practices
- 2) A best practices evaluation of a number of WSSC’s major cost centers, including: Water Treatment, Wastewater Treatment, Field Services, Procurement, Customer Service, Fleet/Logistics, and CIP/Asset Management.

WSSC Staffing Levels

WSSC has not had a comprehensive benchmarking study since a Competitive Action Program (CAP) effort was done in the late 1990’s. That effort (which included benchmarking and then substantial multi-year follow-up by WSSC work teams) ultimately led to a reduction in WSSC staffing from 2,120 in FY96 to 1,458 in FY06 (a reduction of 662 positions, or over 30 percent of the workforce).

Since FY06, WSSC has steadily increased its workforce. The Approved FY17 budget assumes 1,778 positions (up 21.4 percent since FY06).

The 2016 benchmarking study slide on ©11 notes that, overall, WSSC’s current staffing appears to be at or below the median compared with its peers.

Rate Increases

WSSC’s volumetric water and sewer rates have also increased substantially over the same period. The table below shows that, from FY06 through FY15 (prior to the change in the Account Maintenance Fee and implementation of the first phase of the Infrastructure Investment Fee in FY16), rates have increased on average 6.63 percent per year, with a compounded impact of 89.5 percent. Interestingly, expenditures have only increased 43.1 percent over that same time (with an average annual increase of

¹ The full report is available for download at:
<http://www.montgomerycountymd.gov/council/Resources/Files/REPORTS/VeoliaUtilityBenchmarkingOrgEfficiencyRev-WSSC.pdf>

4.29 percent per year).²

**WSSC Rate Increase and Budget Increase Percentages
FY06 through FY15**

	Rate Increases		Operating Budget	Percent Increase
	Annual	Compounded		
FY06	2.5%	2.5%	494,347	6.3%
FY07	3.0%	5.6%	502,090	1.6%
FY08	6.5%	12.4%	525,874	4.7%
FY09	8.0%	21.4%	552,705	5.1%
FY10	9.0%	32.4%	590,531	6.8%
FY11	8.5%	43.6%	605,550	2.5%
FY12	8.5%	55.8%	626,145	3.4%
FY13	7.5%	67.5%	661,773	5.7%
FY14	7.3%	79.6%	698,773	5.6%
FY15	5.5%	89.5%	707,190	1.2%
average annual increase =	6.63%		average annual increase =	4.29%
			cumulative =	43.1%

Two years ago, Council Staff asked WSSC for comparative rate increases for other utilities. The slide on ©33 shows rate increases since 2002 for a number of utilities. The utilities are clustered into categories of 70 to 89 percent, 90 to 129 percent, and 130 to 233 percent. WSSC’s rate increase from 2002 to FY14 is 85 percent. The regional CPI during that time was 34.4 percent. The chart shows that many water and sewer utilities have increased rates well above the CPI in the last decade. WSSC’s rate increase trend over that time is not the lowest, but is on the edge of the lower third and middle third of the utilities presented.

Last fall, WSSC did some FY16 residential bill comparisons (see ©34) and a bill comparison as a percentage of median income (see ©35) across a number of water utilities. In both cases, WSSC’s level appears in the lower half of the spread of utilities.

The benchmarking study (see slides on ©15 and ©32) looked at current average single-family residential bills across large national and regional water/sewer utilities and concluded that WSSC’s bills are at or below the average in terms of total and affordability (as a percentage of household income). However, the study notes that for larger water consumers, the affordability impact is much greater. This makes sense given WSSC’s current rate structure, which charges all water used at increasing amounts based on average daily consumption. The study also notes that WSSC’s rate structure provides a less stable base of revenue. **WSSC recently initiated a comprehensive rate study that will consider issues reviewed above, such as customer affordability and revenue stability.**

² The rate of increase in water and sewer rates over the FY06 through FY15 period is more than double that of the rate of increase in expenditures. This is because WSSC’s primary source of funding is from volumetric water and sewer fees. Water production has been flat over the past 20 years, despite increases in the population served, due to declining per capita water usage. This trend has resulted in rate increases being needed to offset revenue shortfalls, in addition to funding increased expenditures.

Much of WSSC's ramp-up in staffing and rates has been a result of its increased infrastructure recapitalization work in recent years to address aging water/sewer pipe infrastructure. WSSC has also faced increased environmental regulation costs over time (such as its sanitary sewer overflow (SSO) Consent Decree).

The WSSC Commissioners were briefed on the study on June 15. The Prince George's County Council was briefed on June 21.

Report Summary

General Benchmarking

The slide on ©12 summarizes the general benchmarking results from industry metrics reviewed and concludes that WSSC did better than the combined utility median in 8 of 11 best practice elements.

In addition to the staffing and rate review noted earlier, the general benchmarking effort also looked at "the effectiveness of business operations" using the "Effective Utility Management" framework endorsed by the United States Environmental Protection Agency and the trade associations that serve the water and wastewater industry. WSSC exceeded the industry median in 6 of 10 attributes. One attribute (operational resilience) could not be assessed due to lack of data, and three attributes "offer opportunities for improvement." These include: customer satisfaction, operational optimization, and infrastructure stability.

The general benchmarking effort also looked at financial performance (see ©14) and gave WSSC mixed results. WSSC is the only utility reviewed with an across the board AAA bond rating. WSSC also has the smallest percentage of revenue coming from its top 10 customers. However, WSSC is above the median in debt per capita and has an above average "capital intensity" (ratio of net asset value to revenues).

Best Practices Evaluation

The review of WSSC's practices in seven areas shows mixed results (see ©17-18). Three areas in particular—Customer Service, Fleet, and CIP-Asset Management—are noted for initial focus for improvements. Procurement and Utility Services also show potential for significant improvement. Detailed recommendations are noted on ©18-26.

Next Steps

For the July 21 briefing, Council Staff has asked WSSC to provide its initial reactions to the findings/recommendations in the consultant report. For instance, based on the report, what are WSSC's planned next steps? Does WSSC agree with all of the report's findings and recommendations, or are there some areas of disagreement? What is WSSC already doing—or planning to implement soon—to address some of the issues raised?

The results of this report are expected to influence the FY18 spending control limits process this fall and the upcoming CIP and Operating Budget reviews next year.

WSSC has indicated that it is reviewing the best practice recommendations in each of the specific areas and will develop action plans going forward. In some cases, such as in customer service and

procurement, initiatives are already underway and the report recommendations can be incorporated into those efforts. Also, as noted earlier, WSSC recently initiated a comprehensive rate study that will consider issues identified in the benchmarking study, such as customer affordability and revenue stability.

Attachments

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Washington Suburban Sanitary Commission

Utility Benchmarking & Organizational Efficiency Review

Montgomery County Briefing



July 21, 2016

Meeting Objectives

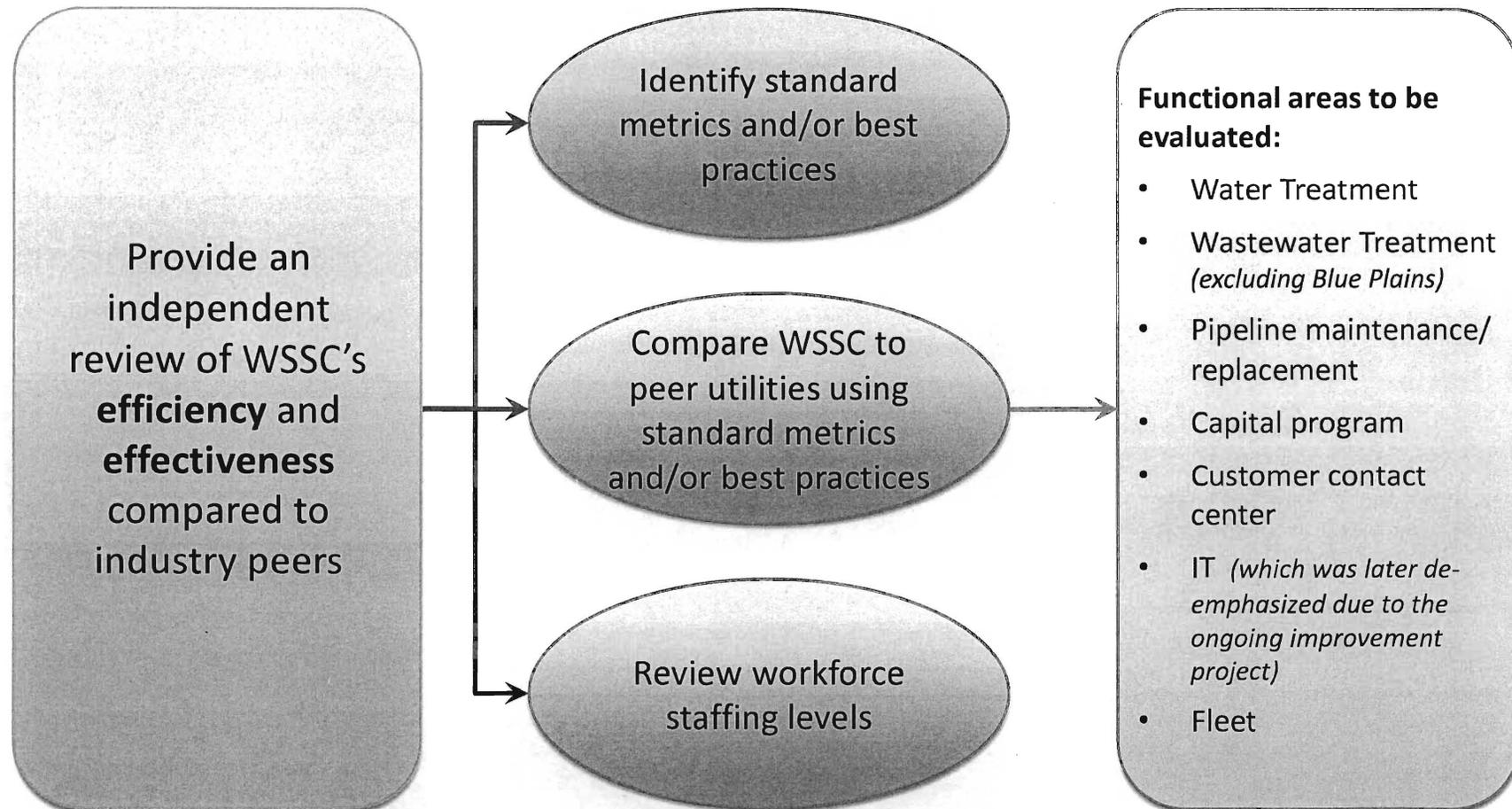
- Project Primer and Timeline
- Study Findings Summary
 - *General Benchmarking*
 - *Customer Service*
 - *Fleet*
 - *CIP/Asset Management*
 - *Procurement*
 - *Utility Services*
 - *Water Treatment*
 - *Wastewater Treatment*
- Q&A



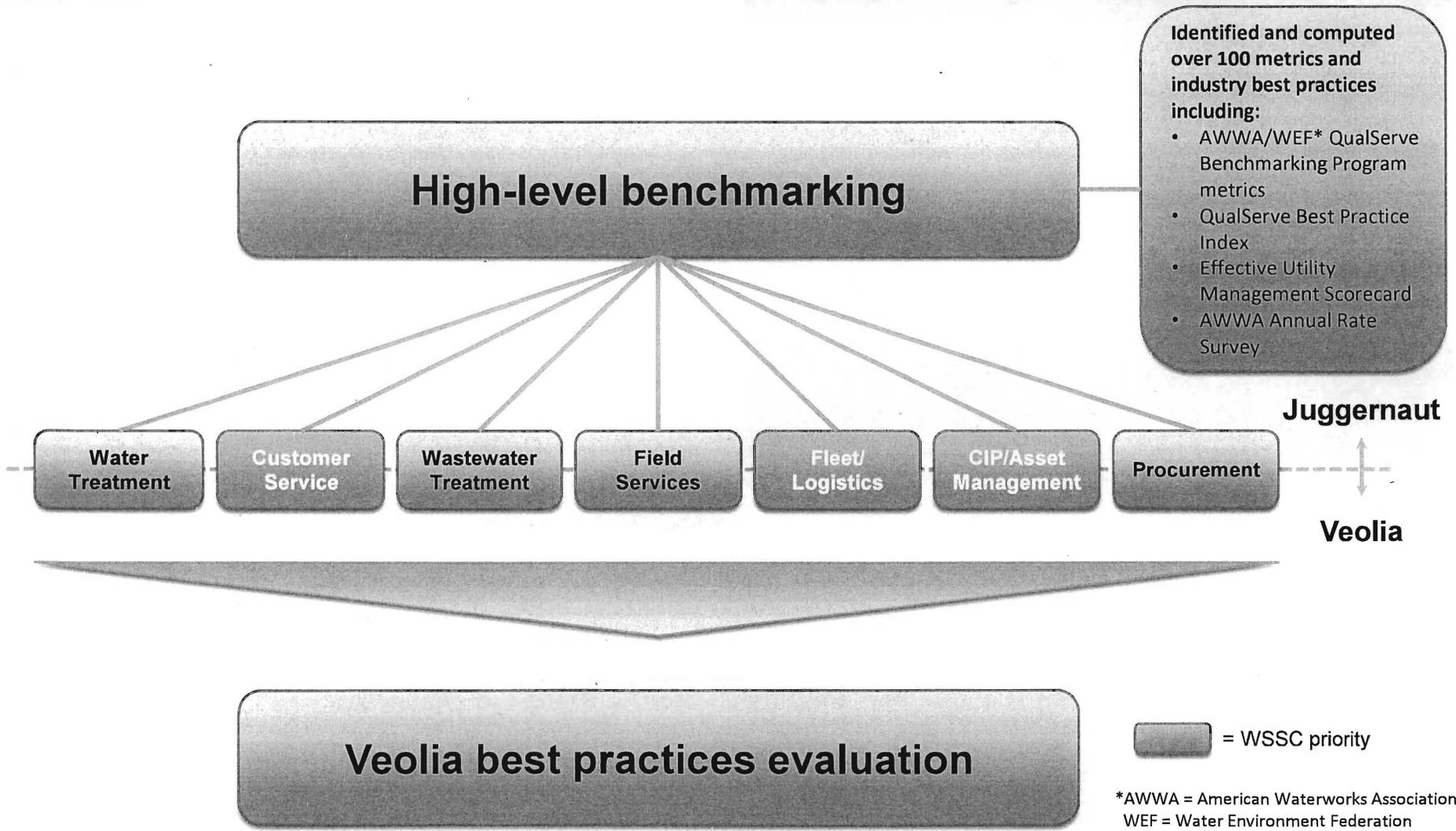


Project Primer and Timeline

The objectives of this study were multi-tiered...



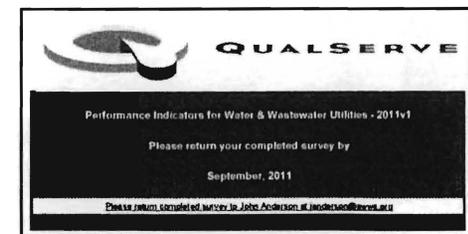
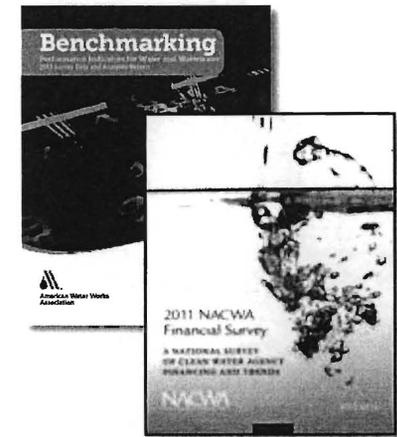
...which led to our two-pronged approach to the Study



Part one: High-level benchmarking

1. QualServe benchmarking comparisons were made with:
 - *Combined water and sewer utilities*
 - *Large utilities**
2. Staffing comparisons were made with large utilities*, with functional comparisons made with:
 - *Similarly regulated utilities*
 - *Utilities with large pipelines*
3. Rate and affordability comparisons were made with the top 50 utilities
4. Financial metric comparisons were made with large utilities*

Comparisons were made to **more than 70 utilities**. Peer utility groups were formed to reflect the specific comparisons made



* QualServe utilities serving more than 500,000 customers

Part two: Veolia best practices evaluation

Top Down Evaluation:

- Collect and evaluate relevant data, practices and metrics
- Conduct interviews at executive and management levels to validate data, practices and metrics
- Based on defined, internal Veolia standard scale, score performance of WSSC

Identify Opportunities:

- Use gap analysis to identify low scoring performance areas
- Determine potential improvement(s)

Maintenance Management Process Diagnostic

Criteria	Observed elements	Scale				
		Poor	Good practice		Best in class	
		1	2	3	4	5
1 KPI definition	<ul style="list-style-type: none"> 10 operational KPIs available at supervisor and staff level 8/10 KPIs are not directly linked to company performance 					
2 Reporting formats and frequency	<ul style="list-style-type: none"> Indicators tracked on the field but operators not aware of target Reports not up-to-date and focused on financial KPIs 					
3 Data collection, report production	<ul style="list-style-type: none"> Some structure for data and report storage Insufficient IT support 					
4 Target setting	<ul style="list-style-type: none"> Some targets assigned but most people unaware of them 					
5 Improvement planning (mid term)	<ul style="list-style-type: none"> No improvement actions defined 					
6 Performance review	<ul style="list-style-type: none"> Meeting at management level only (not line) Discussion focused on performance gaps, but preliminary analysis often not done (lack of ownership) 					

Diagnostic summary

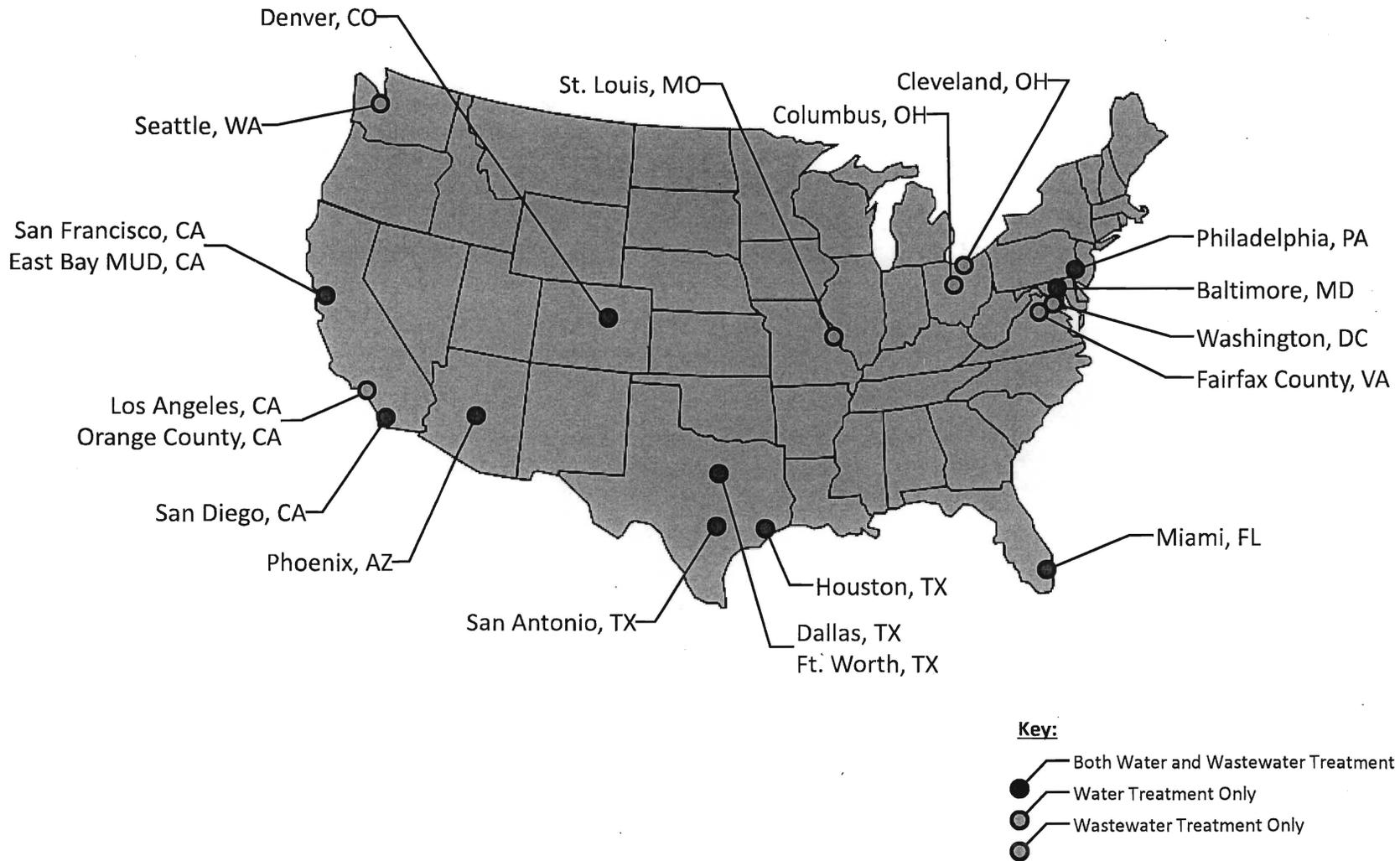




Study Findings Summary:

- General Benchmarking
- Veolia Best Practices Assessment

Peer utilities of similar size and function as WSSC were chosen for the Benchmarking effort

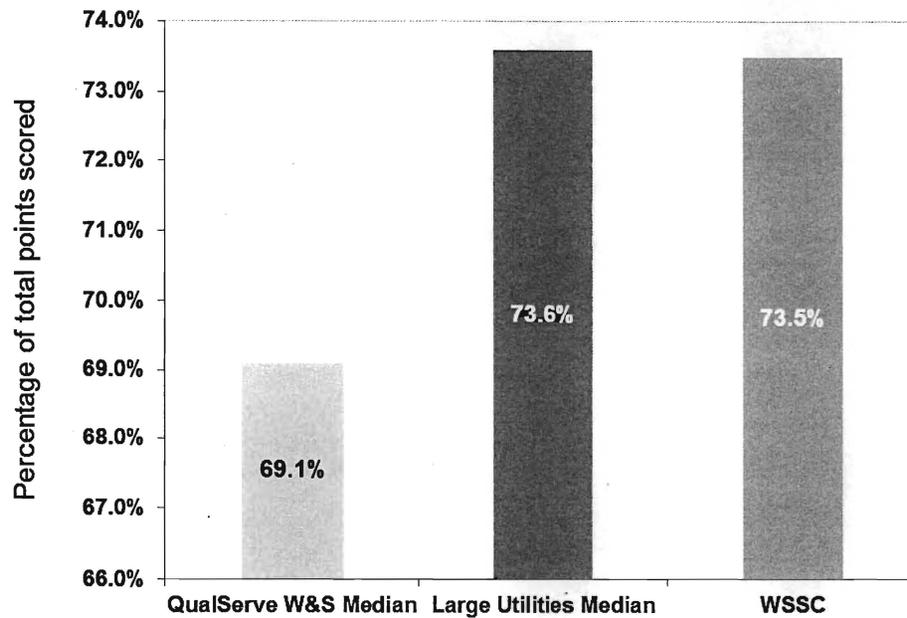


Overall, WSSC staffing generally appears to be at or below the median compared with its peers

Staffing Focus	Comparison	Result
Water services	Large Utilities	 Below median
Wastewater services	Large utilities	 Below median
W/W Treatment FTEs	Chesapeake Bay dischargers	 Below median
Collection system FTEs	Utilities with large collection systems	 Below median
Functional area staffing	19 large utilities	 At or below average except for IT and Engineering and Construction
Staffing Distribution	QualServe utilities – large and combined water and sewer	 Management and Engineering high; others at or below median



In aggregate, WSSC scores above the QualServe W&S population and slightly below Large Utilities



Findings:

- WSSC did better than the combined utility median for 8 out of the 11 best practice elements:** *Long-Term Financial Planning, Risk Management Planning, Governing Body, Customer Involvement, Customer Involvement, Drought Response, Source Water Protection Plan, Succession Planning, and Continuous Improvement*
- In two of WSSC's lowest score areas, the utility universe, as a whole, did poorly.** This suggests that these areas are still industry-level challenges and not necessarily specific to WSSC.

In aggregate, WSSC exceeds industry median for 6 of 10 EUM Attributes



Attribute	Performance
Product Quality	●●●●●
Customer Satisfaction	●●●●●
Employee and Leadership Training	●●●●●
Operational Optimization	●●●●●
Financial Viability	●●●●●
Infrastructure Stability	●●●●●
Operational Resilience	N/A*
Community Sustainability	●●●●●
Water Resource Adequacy	●●●●●
Stakeholder Understanding and Support	●●●●●

*WSSC only had information readily available at the time of the study to calculate measures related to 9 of 10 areas, as indicated

Financial performance, compared with its peers, is mixed (WSSC in green)

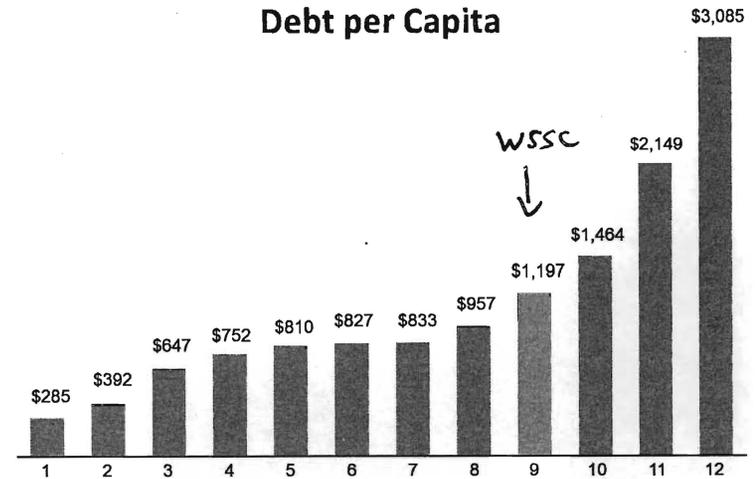
Measure	WSSC	QualServe Median*	Large-Utility Median
Bond rating	AAA	AA	n/a
Debt ratio	34.2%	36.5%	53.0%
Return on assets	1.2%	1.5%	1.8%
Cash reserves adequacy (days)	276	259	195
Operating ratio	81.0%	61.4%	62.0%

* For bond rating, the median is actually the mode of the measure.

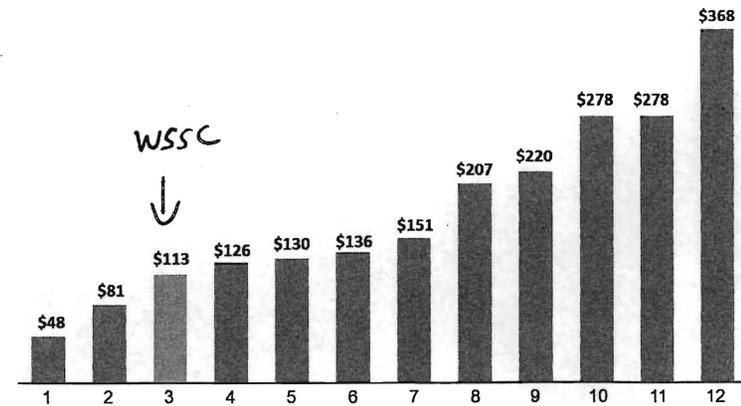
Findings:

- Compared to its peers, **WSSC is the only across the board AAA Bond Rating.**
- WSSC also has the smallest percentage of revenue attributable to its 10 largest customers, which is an **indicator of revenue stability.**
- In addition to high debt levels, **WSSC also has an above average capital intensity** (ratio of net asset value to revenues).
- A promising sign is that the WSSC 5 year CIP (on a per capita basis) is below its peers offering an opportunity to improve its relative debt levels.

Debt per Capita

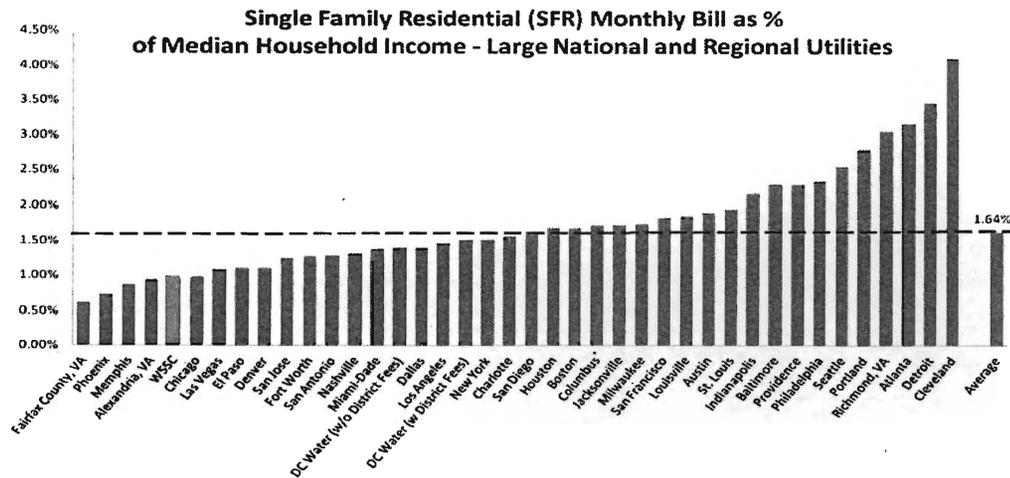
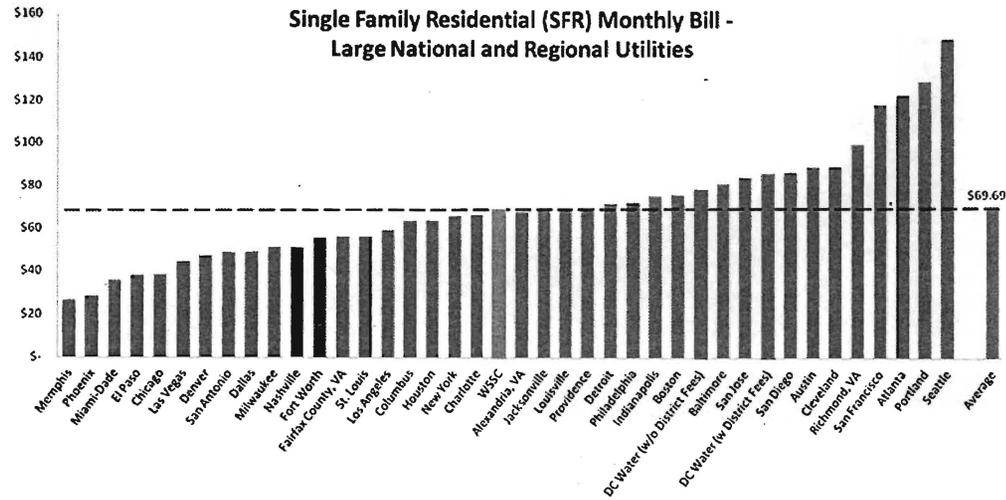


Annual Capital Expenditures per Capita



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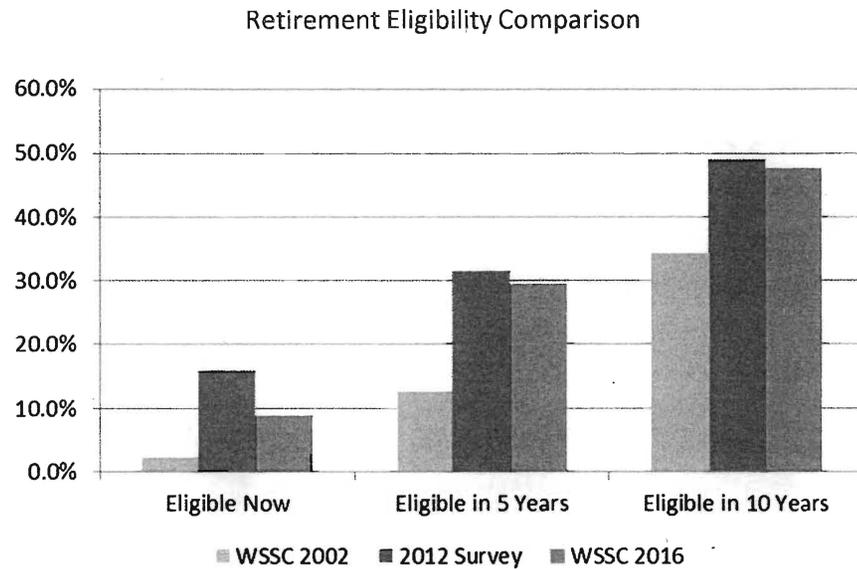
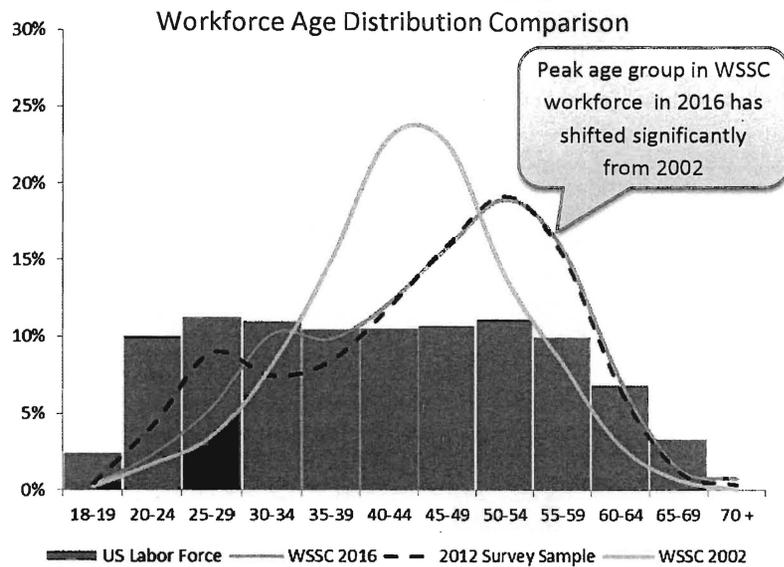
SFR monthly bills and affordability, compared to large utilities, is at or below average



Findings:

- Despite historic declining per-capita usage, previous rate structure analyses have consistently found that there is no statistically significant correlation between the decline and prices.
- WSSC has a nonlinear rate structure because the rate charged to the entire volume of flow is dependent on the average daily level of flow.
- The rate structure does incentivize conservation, but when a customer can reduce consumption to be charged a slightly lower rate on the entire volume, the **revenue will decrease by more than the reduction in consumption making revenue less stable than it could be.**

WSSC faces a greater risk from retirements than many other utilities



Findings:

- The age distribution of WSSC has shifted from an approximately normal distribution to one that is **more heavily skewed in favor of older workers**.
- Although this transition reflects a **workforce turnover that is much lower in the utility industry**, it leads to higher average years of service.
- The average age of the U.S. workforce is approximately 42.34 years, while WSSC's is 46.68 years.

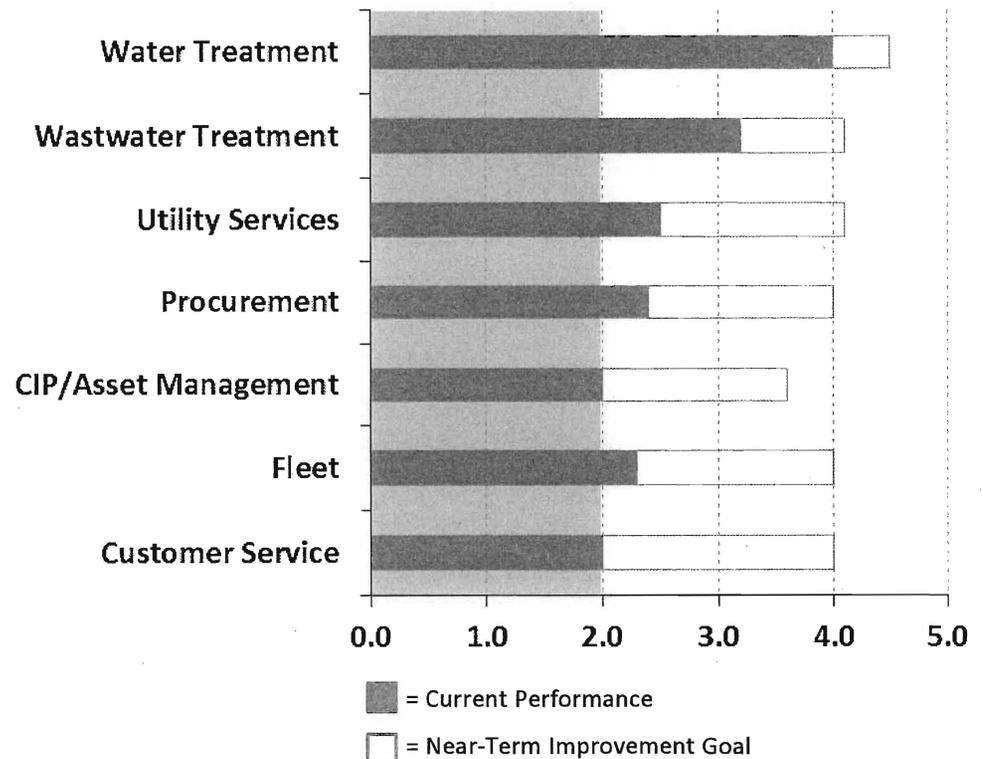
Best Practices Assessment for seven business groups within WSSC shows mixed results

WSSC Performance on Veolia Standards Scale:

- **Scoring:** Based on a scale from 1 (basic) to 5 (best in class)
- **Current Performance:** Based on a combination of data review, staff interviews and site observations
- **Near-Term Improvement Goal:** Based on current landscape, identifies where could WSSC be in less than 24 months with recommended improvement initiatives
- **Context:** Scores achieved for a large utility such as WSSC would normally range from 3 to 5.

Assessment Results:

- Production (Water and Wastewater Treatment), in general, is performing relatively well
- Customer Service, Fleet and Asset Management are struggling



Composite gap analysis summary identifies how significant differences in performance are

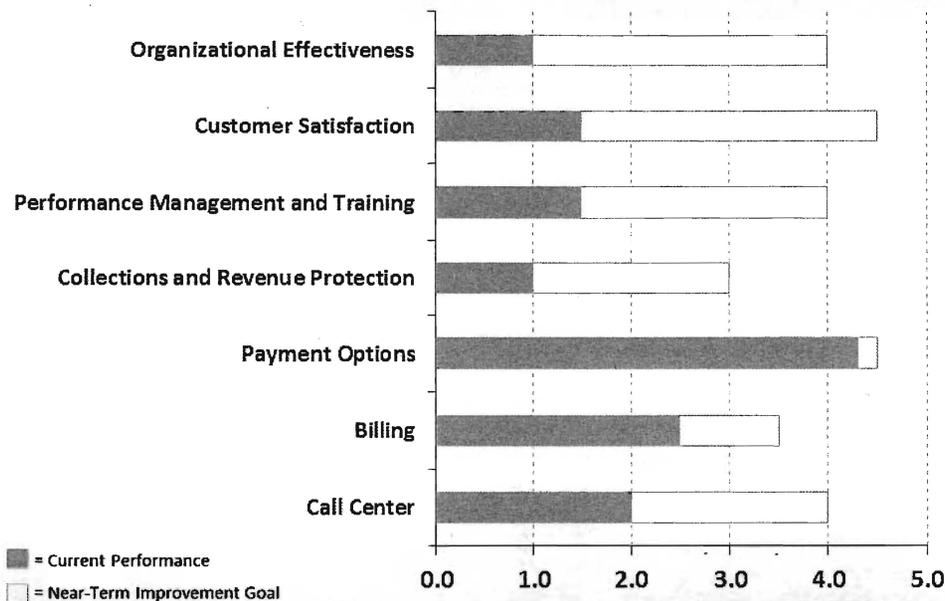
Business Area	WSSC Current Performance Score	Near-Term Improvement Goal	Arithmetic Difference	Significant?
Customer Service	2.0	4.0	2.0	Yes
Fleet	2.3	4.0	1.7	Potentially
CIP-Asset Management	2.0	3.6	1.6	Potentially
Procurement	2.4	4.0	1.6	Potentially
Utility Services	2.5	4.1	1.6	Potentially
Wastewater Treatment	3.2	4.1	0.9	No
Water Treatment	4.0	4.5	0.5	No

Recommended Areas of Initial Focus

Calculating the gap:

- The difference between actual performance and the near-term performance goal forms the basis of a gap analysis used to prioritize areas that have potential for additional improvement
- Any arithmetic difference of 2.0 or greater between actual performance and the near term performance goal was considered significant, and any difference in scores between 1.5 and 1.9 was considered potentially significant

Overall performance and gap analysis in CUSTOMER SERVICE

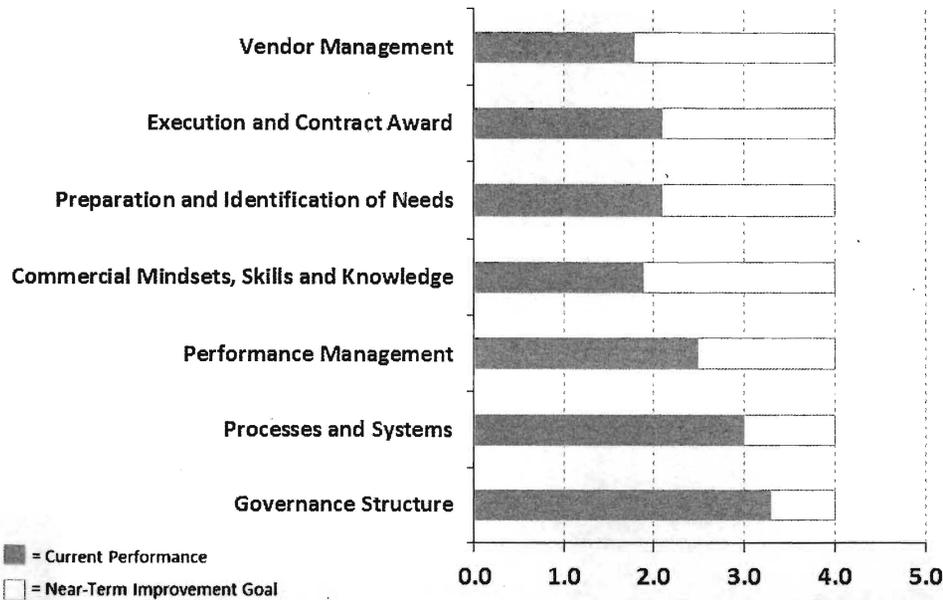


Key Recommendations for Improvement:

- **Implement a data-driven customer service management system** based on industry standard KPIs and targeted levels of service; include reports of operational metrics reviewed regularly by various levels of management, with high-level KPIs reported upward to the Board of Commissioners.
- **Document Customer Service policies, procedures and processes**, including formalizing a process for handling escalated customer complaints; include a monthly process of analyzing root causes of complaints.
- **Cross-train all contract CSRs to handle all calls**, eliminate staffing of a special transfer queue, and change the current call routing scheme to funnel calls to the next available agent.
- Modify the call center interactive voice response (IVR) system to include the option of reporting an emergency as a first option, then **use just one phone number for customers**.
- **Use a professional utility bill print vendor service** to gain operational efficiencies.
- **Establish a dedicated field meter team**, that reports to Customer Service rather than Utility Services, to perform meter readings, shut-offs, turn-ons, collections, etc.
- **Design and implement a quarterly, transactional, telephone-based customer satisfaction survey** administered by a third-party market research firm to gain insight and analytics for analyzing and planning of customer service performance improvement initiatives.

Category	WSSC Current Performance Score	Near-Term Improvement Goal	Arithmetic Difference	Significant?
Call Center	2.0	4.0	2.0	Yes
Billing	2.5	3.5	1.0	No
Payment Options	4.3	4.5	0.2	No
Collections and Revenue Protection	1.0	3.0	2.0	Yes
Performance Management and Training	1.5	4.0	2.5	Yes
Customer Satisfaction	1.5	4.5	3.0	Yes
Organizational Effectiveness	1.0	4.0	3.0	Yes

Overall performance and gap analysis in PROCUREMENT



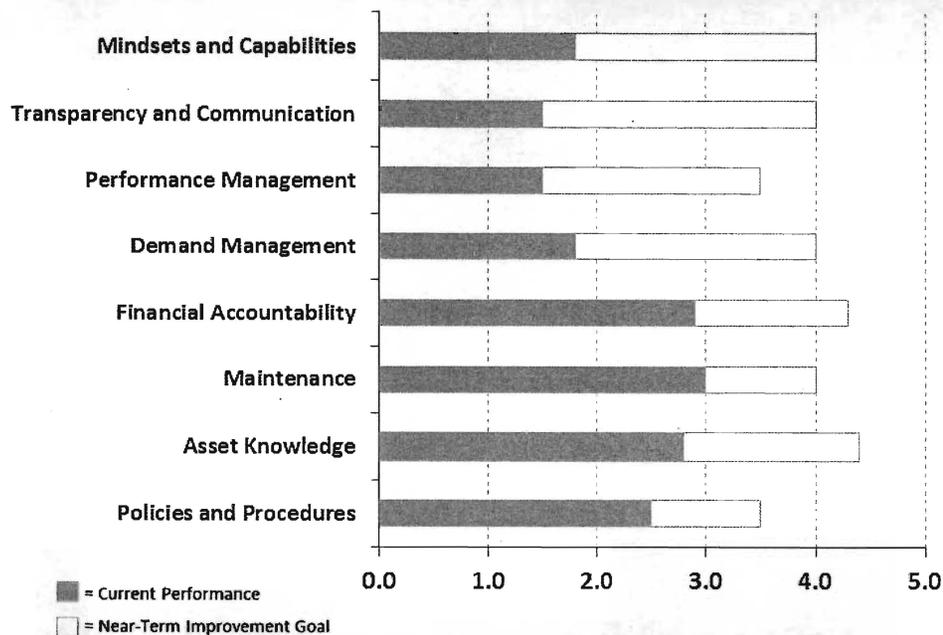
Category	WSSC Current Performance Score	Near-Term Improvement Goal	Arithmetic Difference	Significant?
Governance Structure	3.3	4.0	0.7	No
Processes and Systems	3.0	4.0	1.0	No
Performance Management	2.5	4.0	1.5	Potentially
Commercial Mindsets, Skills and Knowledge	1.9	4.0	2.1	Yes
Preparation and Identification of Needs	2.1	4.0	1.9	Potentially
Execution and Contract Award	2.1	4.0	1.9	Potentially
Vendor Management	1.8	4.0	2.2	Yes

Key Recommendations for Improvement:

- **Implement a performance management system** that is data driven, complete with KPIs based on level of service (LOS), performance metrics and LOS targets.
- **Staffing:** Fill the strategic vacant positions, develop category buyers, and clarify the roles and responsibilities of the Ops and Admin team.
- Develop and implement business practices that:
 - **Control the approval process and timelines**, including an electronic document management system
 - Use industry-standard benchmarking tools such as BidNet or SmartProcure.
 - **Expand metrics tracked** to include quality, cost, end-user satisfaction, vendors' performance, and spend compliance.
 - Outline and assign responsibility to **perform evaluation of vendor performance** (e.g. tracking/analysis of delivery times, packaging/delivery options, vendor wait times when unloading product, forecast vs. usage, etc.).
 - Describe and assign responsibility to **perform analysis of the market basket** (spend vs. forecast) to improve demand projections, and formally track historical usages.

20

Overall performance and gap analysis in FLEET

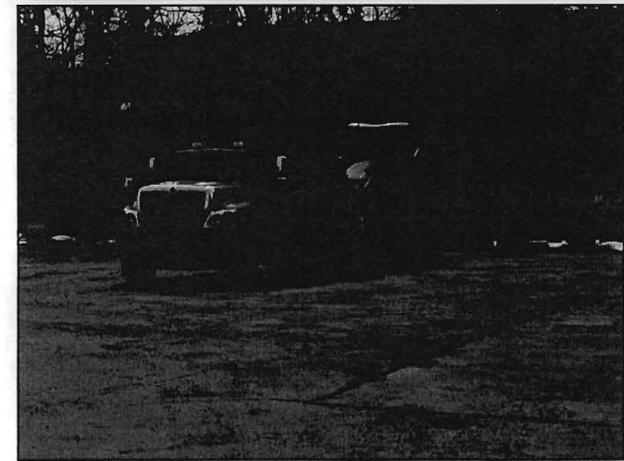
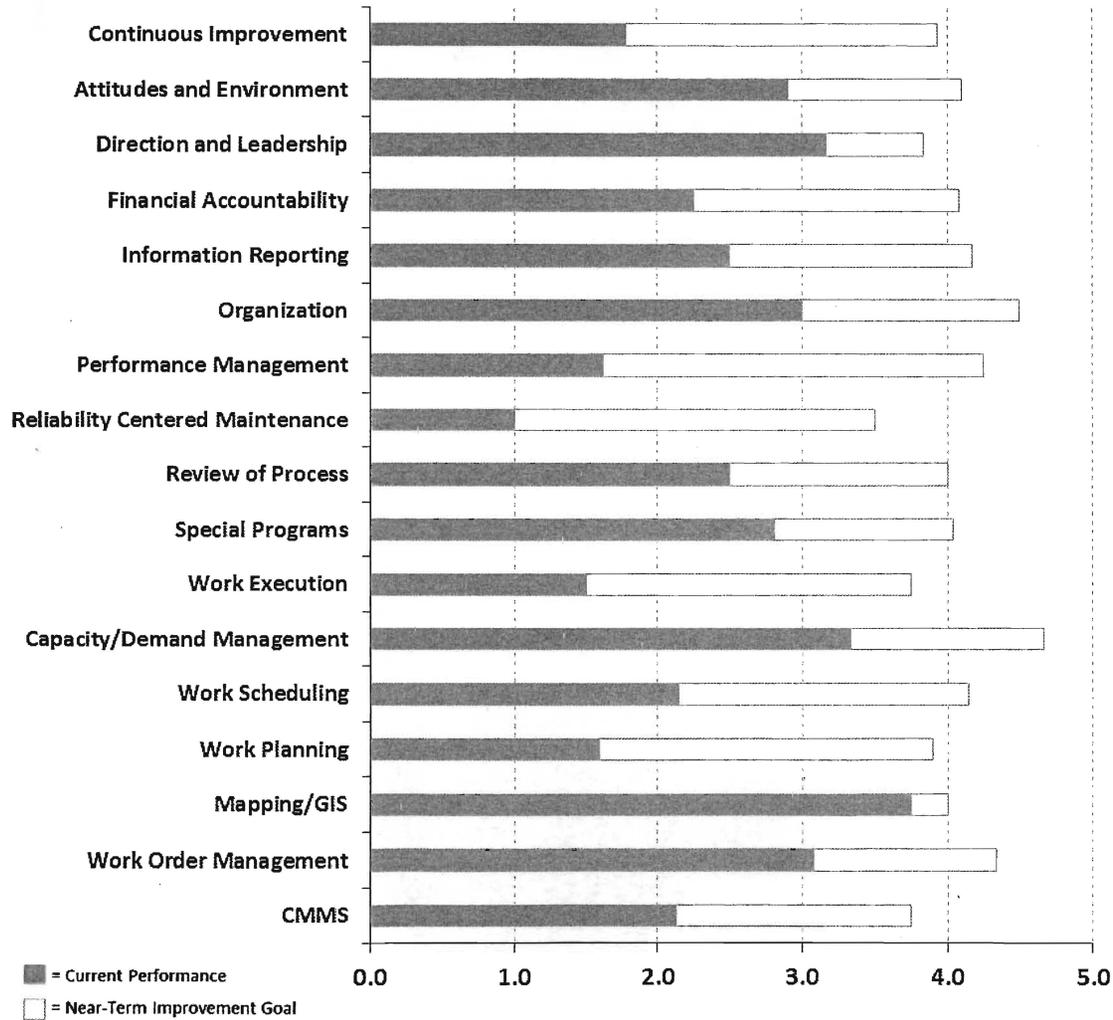


Category	WSSC Current Performance Score	Near-Term Improvement Goal	Arithmetic Difference	Significant?
Policies and Procedures	2.5	3.5	1.0	No
Asset Knowledge	2.8	4.4	1.6	Potentially
Maintenance	3.0	4.0	1.0	No
Financial Accountability	2.9	4.3	1.4	No
Demand Management	1.8	4.0	2.2	Yes
Performance Management	1.5	3.5	2.0	Yes
Transparency and Communication	1.5	4.0	2.5	Yes
Mindsets and Capabilities	1.8	4.0	2.2	Yes

Key Recommendations for Improvement:

- **Implement a performance management system** that is data driven, complete with KPIs based on level of service (LOS), performance metrics and LOS targets.
- Assign someone from Logistics to **be responsible for regular QA/QC** of the data. Review TEAMS system fields to identify those that can be standardized to improve simplicity and analysis.
- **Install in-vehicle monitoring system (IVMS)** on each vehicle, providing the ability to track vehicle usage.
- Conduct a **comprehensive evaluation of right-sizing the fleet should be performed** to look for opportunities to reduce overall life cycle costs, including fuel, for vehicles in the fleet.
 - Evaluate the potential to **rent or lease specialty vehicles and equipment that are seldom used** and historically carry significant repair costs.
- **Develop standard vehicle specifications** to allow for bulk buying, better pricing and increased simplicity. Using TEAMS, develop metrics and dashboards that provide business cases for improvement in making vehicle and equipment purchasing decisions.
- **Establish clear communication channels**, both internally among Logistics and with other WSSC groups, and define how information gets circulated.

Overall performance and gap analysis in UTILITY SERVICES



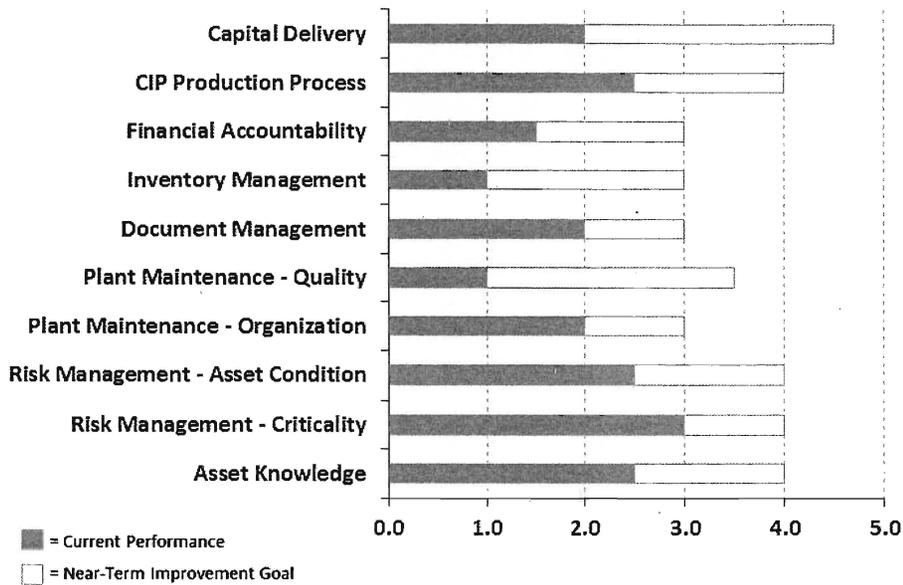
Overall performance and gap analysis in UTILITY SERVICES (cont.)

Category	WSSC Current Performance Score	Near-Term Improvement Goal	Arithmetic Difference	Significant?
CMMS	2.1	3.8	1.6	Potentially
Work Order Management	3.1	4.3	1.3	No
Mapping/GIS	3.8	4.0	0.3	No
Work Planning	1.6	3.9	2.3	Yes
Work Scheduling	2.1	4.1	2.0	Yes
Capacity/Demand Management	3.3	4.7	1.3	No
Work Execution	1.5	3.8	2.3	Yes
Special Programs	2.8	4.0	1.2	No
Review of Process	2.5	4.0	1.5	Potentially
Reliability Centered Maintenance	1.0	3.5	2.5	Yes
Performance Management	1.6	4.3	2.6	Yes
Organization	3.0	4.5	1.5	Potentially
Information Reporting	2.5	4.2	1.7	Potentially
Financial Accountability	2.3	4.1	1.8	Potentially
Direction and Leadership	3.2	3.8	0.7	No
Attitudes and Environment	2.9	4.1	1.2	No
Continuous Improvement	1.8	3.9	2.1	Yes
Staff Development	3.0	4.0	1.0	No

Key Recommendations for Improvement:

- **Implement a performance management system** that is data driven, complete with KPIs based on level of service (LOS), performance metrics and LOS targets.
- **Use the CMMS as an asset management tool.**
 - Track only work performed by WSSC personnel in CMMS.
 - Actual labor times and material costs should be also be tracked against each work order.
 - Include replacement costs and estimated design life for each asset in CMMS.
 - Conduct regular, comprehensive inventories and condition assessments for all assets.
 - Conduct regular trend analyses on maintenance histories for critical assets.
- **Provide one centralized planning group that evaluates ALL incoming work.**
- **Develop and implement a more-technical approach to large-meter testing/replacement** that focuses specifically on 20% of meters that correspond to the top 80% of revenue generation.
- **Develop a more-robust water balance accounting,** performed at least quarterly, in conjunction with a proactive leak detection program.

Overall performance and gap analysis in ASSET MANAGEMENT/CIP



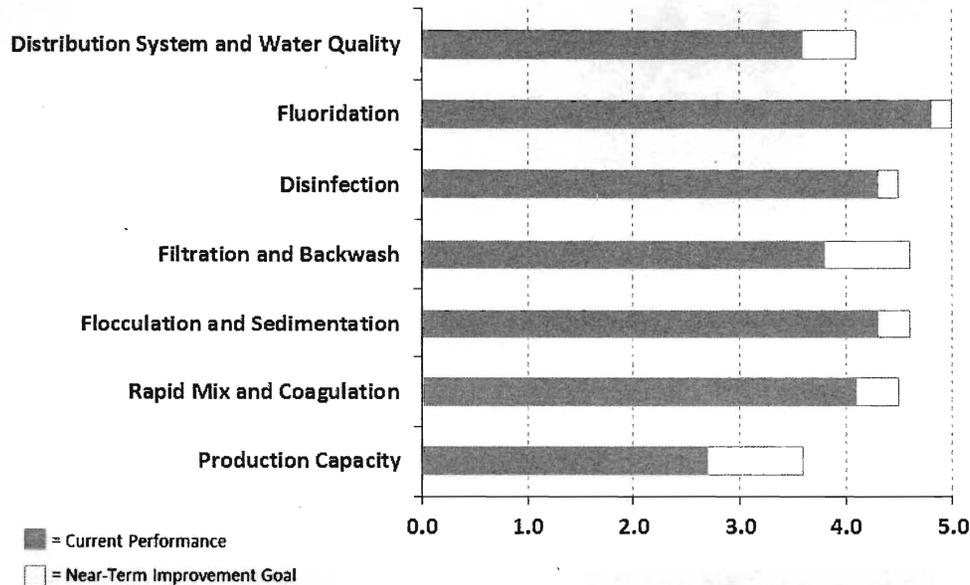
Category	WSSC Current Performance Score	Near-Term Improvement Goal	Arithmetic Difference	Significant?
Asset Knowledge	2.5	4.0	1.5	Potentially
Risk Management - Criticality	3.0	4.0	1.0	No
Risk Management - Asset Condition	2.5	4.0	1.5	Potentially
Plant Maintenance - Organization	2.0	3.0	1.0	No
Plant Maintenance - Quality	1.0	3.5	2.5	Yes
Document Management	2.0	3.0	1.0	No
Inventory Management	1.0	3.0	2.0	Yes
Financial Accountability	1.5	3.0	1.5	Potentially
CIP Production Process	2.5	4.0	1.5	Potentially
Capital Delivery	2.0	4.5	2.5	Yes

Key Recommendations for Improvement:

- Implement a performance management system that is data driven, complete with KPIs as well as performance targets with respect to project delivery.
- Further develop the existing asset management plan to cover all assets and use a needs-based identification.
 - Continually refine and fully implement project prioritization with the goal of meeting CIP budget expenditure targets.
 - Further develop, document and implement a new production processes that focuses on and represents level of service (LOS) in a well-defined manner.
- Incorporate a robust process of verifying, validating and updating:
 - Key asset knowledge and improving the accuracy of replacement values
 - Business risk exposure and improving its use in driving operations' strategies
 - Asset condition, improving its use in driving operations' strategies and development of a condition-based monitoring strategy.

24

Overall performance and gap analysis in WATER TREATMENT

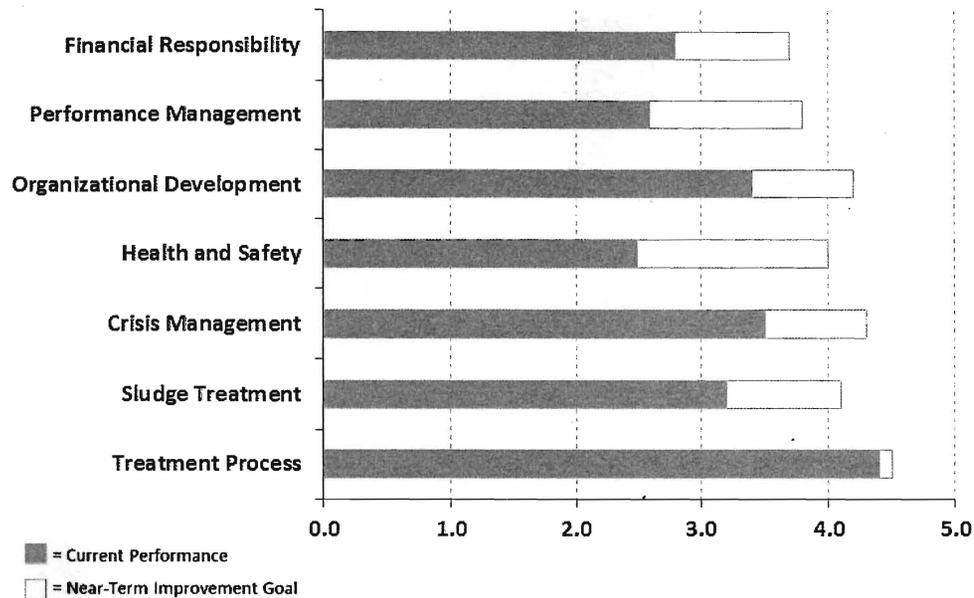


Category	WSSC Current Performance Score	Near-Term Improvement Goal	Arithmetic Difference	Significant?
Production Capacity	2.7	3.6	0.9	No
Rapid Mix and Coagulation	4.1	4.5	0.4	No
Flocculation and Sedimentation	4.3	4.6	0.3	No
Filtration and Filter Backwash	3.8	4.6	0.8	No
Disinfection	4.3	4.5	0.2	No
Fluoridation	4.8	5.0	0.2	No
Distribution System and Water Quality	3.6	4.1	0.5	No

Key Recommendations for Improvement:

- **Develop process control management plans** that would proactively manage the treatment process, further developing key performance indicators.
- **Reevaluate the need to implement enhanced coagulation** at the Potomac plant.
- **Conduct routine annual filter assessments** including, but not limited to, filter coring, bed expansion, backwash duration evaluations, and media examinations on representative filters to maximize filter performance.
- **Conduct quarterly reviews of CT compliance** to identify how much actual clearwell storage is necessary for CT and how much storage capacity could be taken offline to reduce DBP formation potential and onsite chlorine residual decay.
- **Conduct chlorine decay evaluations** and compare to systems residuals to determine the impacts of pipeline storage and storage tanks on chlorine residual losses.

Overall performance and gap analysis in WASTEWATER TREATMENT

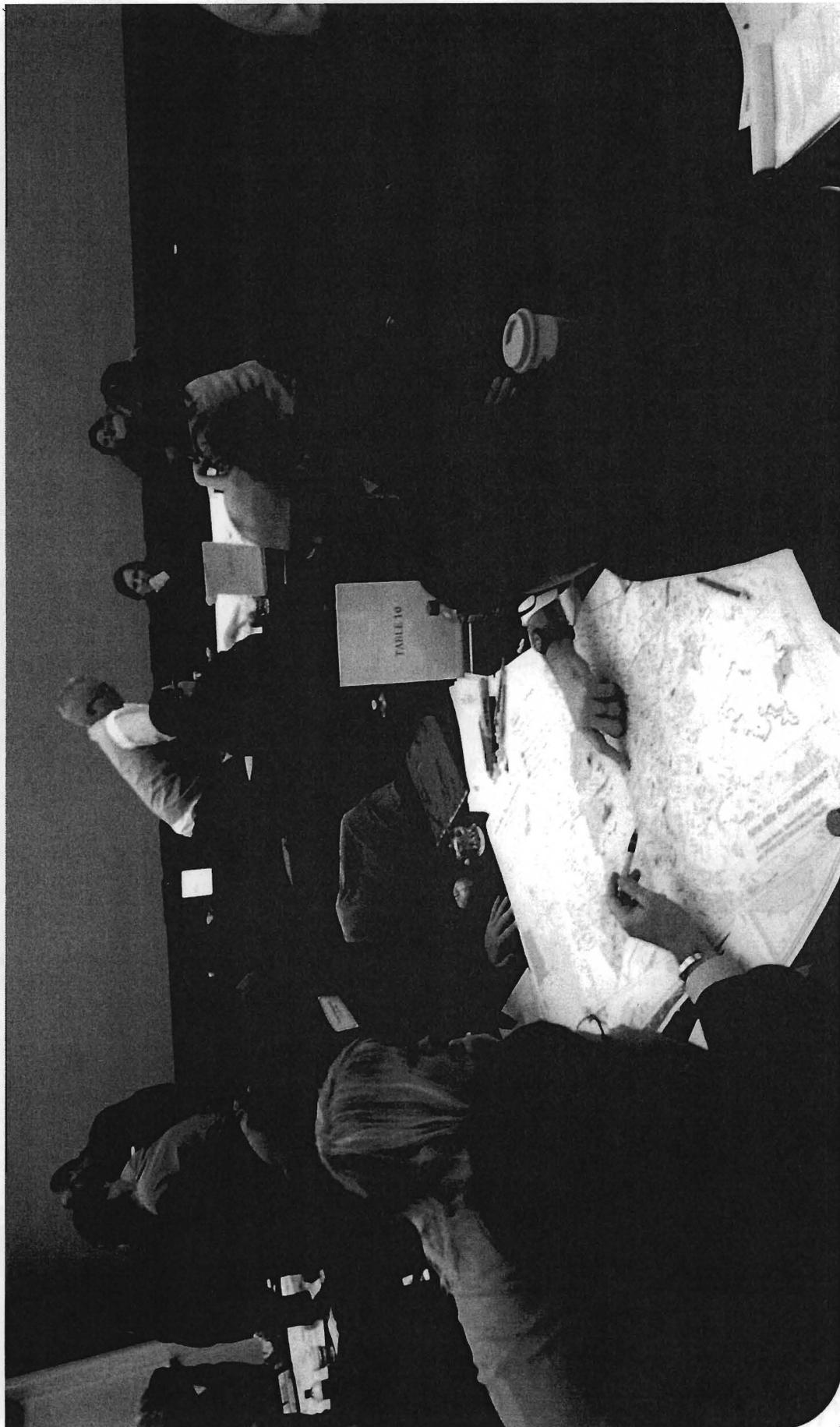


Category	WSSC Current Performance Score	Near-Term Improvement Goal	Arithmetic Difference	Significant?
Treatment Process	4.4	4.5	0.1	No
Sludge Treatment	3.2	4.1	0.9	No
Crisis Management	3.5	4.3	0.8	No
Health and Safety	2.5	4.0	1.5	Potentially
Organizational Development	3.4	4.2	0.8	No
Performance Management	2.6	3.8	1.2	No
Financial Responsibility	2.8	3.7	0.9	No

Key Recommendations for Improvement:

- **Develop process control management plans** that would proactively manage the treatment process, further developing key performance indicators.
- **Develop onsite management and accountability of energy usage** for large pieces of equipment.
- **Develop a mass balance of the entire plant process**, and use routinely as an operational tool.
- Develop yearly budgets with a bottom up approach, **pursuing operational efficiency gains in specific process areas.**
 - Track actual expenditures against targets.
 - Hold plant managers accountable for plant energy expenditures.
 - Shift mindset from a culture of “compliance at all costs” to “compliance at lowest costs”.
- Develop and implement protocols to **hold onsite staff accountable for safety performance**, including tracking and reporting leading and lagging safety metrics.
 - Develop and implement a **formal safety audit program** to ensure policy and procedures are being followed.

Thank you for your time – Please let us answer
any questions you may have



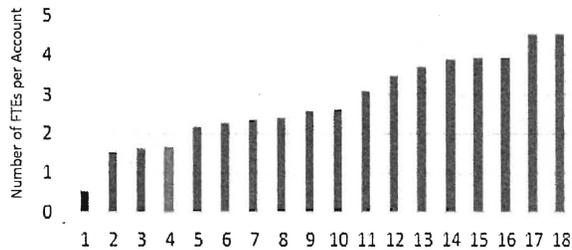


Appendix

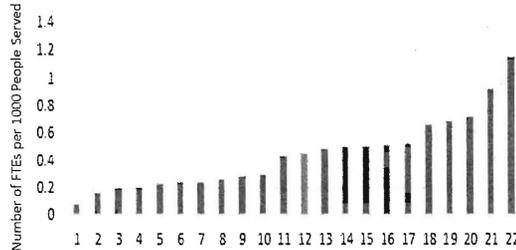
Overall, WSSC staffing appears to be at or below the median compared with its peers (WSSC in green)

WATER

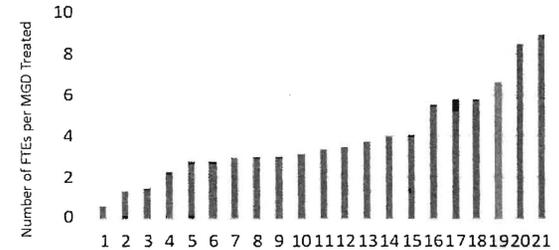
FTEs per Account (Water Treatment Only)



FTEs per 1,000 People Served (Water Treatment Only)

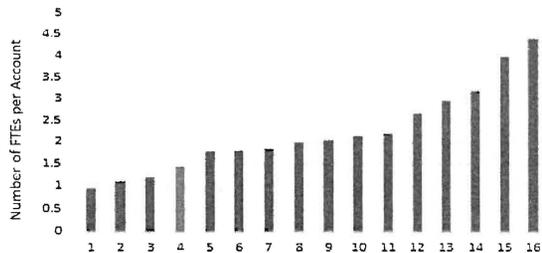


FTEs per MGD Treated (Water Treatment Only)

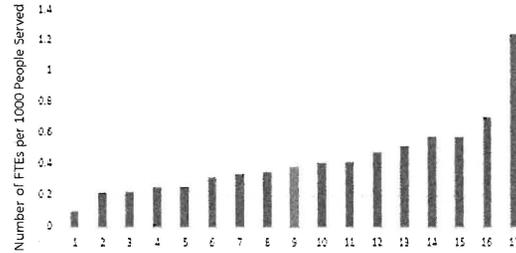


WASTEWATER

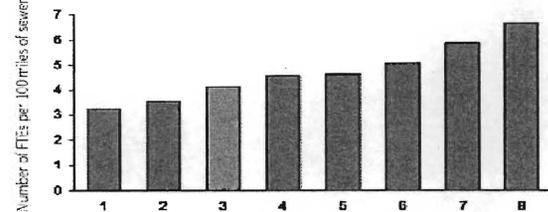
FTEs per 1,000 Accounts (Wastewater Treatment Only)



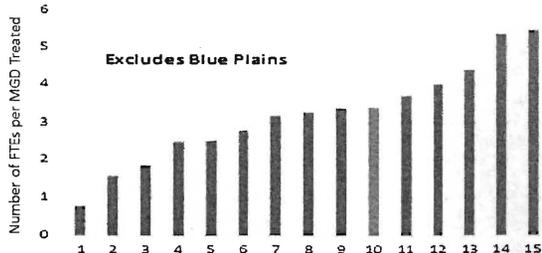
FTEs per 1,000 People Served (Wastewater Treatment Only)



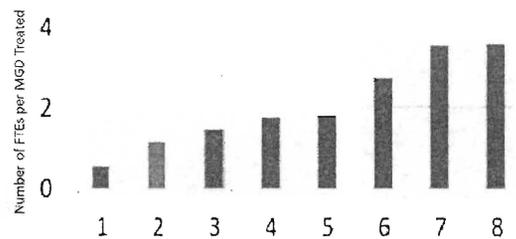
FTEs per 100 miles of Sanitary Sewer (Sewer Collection Only)



FTEs per MGD Treated (Wastewater Treatment Only)



Treatment FTEs per MGD (Chesapeake Bay Wastewater Treatment Only)

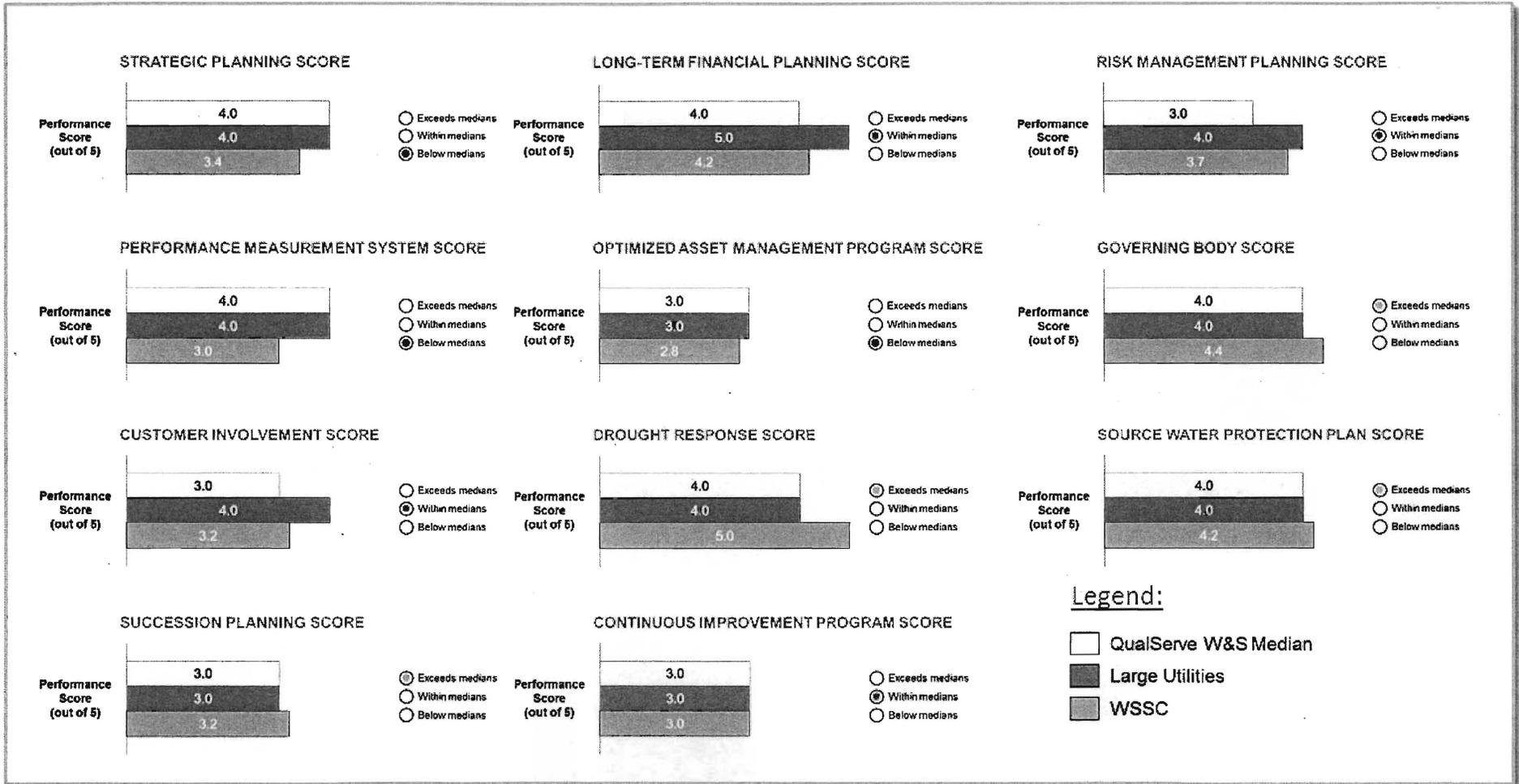


Other Findings:

- Functional staffing levels appear to be below average except for IT, Engineering and Planning. IT is going through a multi-year improvement program. Engineering and Planning have small projects and time consuming procedures related to the SDC program.

29

QualServe Organizational Best Practices (BP) – WSSC performance mixed compared with its peers



WSSC performance measures against 10 EUM Attributes* mixed compared with median values

Product Quality Performance Measures

Measure	WSSC	Median	Performance
Drinking water compliance rate	100%	100%	●
Wastewater treatment effectiveness rate	100%	100%	●
Sanitary sewer overflow rate	2.98	2.5	●

Customer Satisfaction Performance Measures

Measure	WSSC	Median	Performance
Billing accuracy rate	99.7%	99.9%	●
Abandoned call rate	11.8%	10.2%	●
Average wait time (minutes)	2.65	1.22	●
Average talk time (minutes)	5.90	3.50	●

Employee Leadership and Training Performance Measures

Measure	WSSC	Median	Performance
Best Practice Index	39.2	38.0	●
Employee turnover rate	6.6%	8.1%	●
Retirement eligibility (in the next five years)	28.6%	17.3%	●

Operational Optimization Performance Measures

Measure	WSSC	Median	Performance
Customer accounts per employee (combined)	301	476	●
O&M Efficiency – Water (KBTU/yr/MG)	4,661	6,082	●
O&M Efficiency – Wastewater (KBTU/yr/MG)	8,406	7,319	●
MGD of Water Delivered per FTE	0.20	0.24	●
MGD of Wastewater Processed per FTE	0.27	0.18	●

Financial Viability Performance Measures

Measure	WSSC	Median*	Performance
Bond rating	AAA	AA	●
Debt ratio	34.2%	36.5%	●
Return on assets	1.2%	1.5%	●
Cash reserves adequacy (days)	276	259	●

* For bond rating, the term in the median column is actually the mode of the measure.

Infrastructure Stability Performance Measures

Measure	WSSC	Median	Performance
Water distribution integrity rate – leaks	1.9	15	●
Water distribution integrity rate – breaks	31.0	13	●
Wastewater collection system integrity rate	38.1	6.0	●
System Inspection (%) – sewer	2.4%	9.6%	●

Community Sustainability Performance Measures

Measure	WSSC	Median*	Performance
Water loss	17%	14%	●
Water service affordability	0.36%	0.64%	●
Wastewater service affordability	0.50%	0.76%	●
Low income assistance	Yes	-	●
Triple Bottom Line index	75%	55%	●

* For water loss, the term in the median column is actually the estimated mean of the measure.

Water Resource Adequacy Performance Measures

Measure	WSSC	Median*	Performance
Current water demand	50.6%	44%	●
Available future water supply	27.0	28.0	●

Stakeholder Understanding - Support Performance Measures

Measure	WSSC	Median*	Performance
Stakeholder outreach index	66.7%	75.0%	●
Average residential water bill amount for one month service*	\$21.78	\$28.56	●
Average residential sewer bill amount for one month service*	\$30.48	\$32.02	●

* Quarterly bill divided by three. Fixed charges were split evenly between water and sewer cost of service.



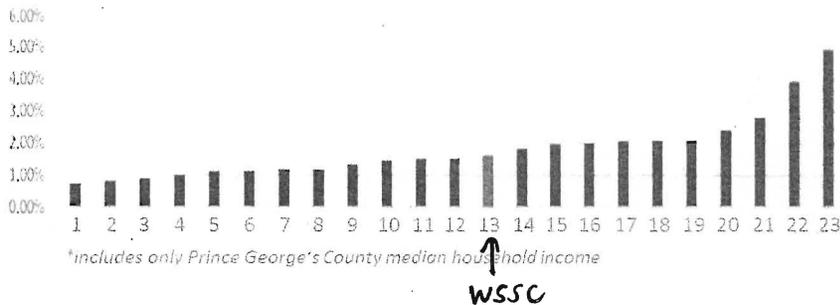
*WSSC only had information readily available at the time of the study to calculate measures related to 9 of 10 areas, as indicated

Bill affordability, compared with its peers, mixed depending on overall water usage (WSSC in green)

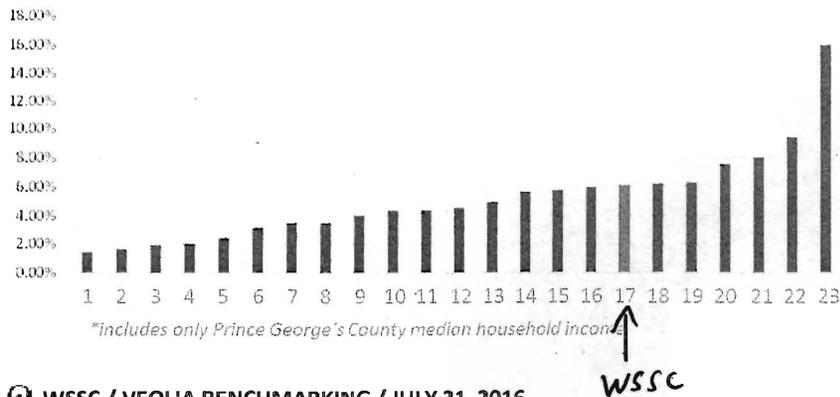
Affordability Comparison for Low Water Consumption (3,740 gal/month) Users



Affordability Comparison for Moderate Water Consumption (7,840 gal/month) Users



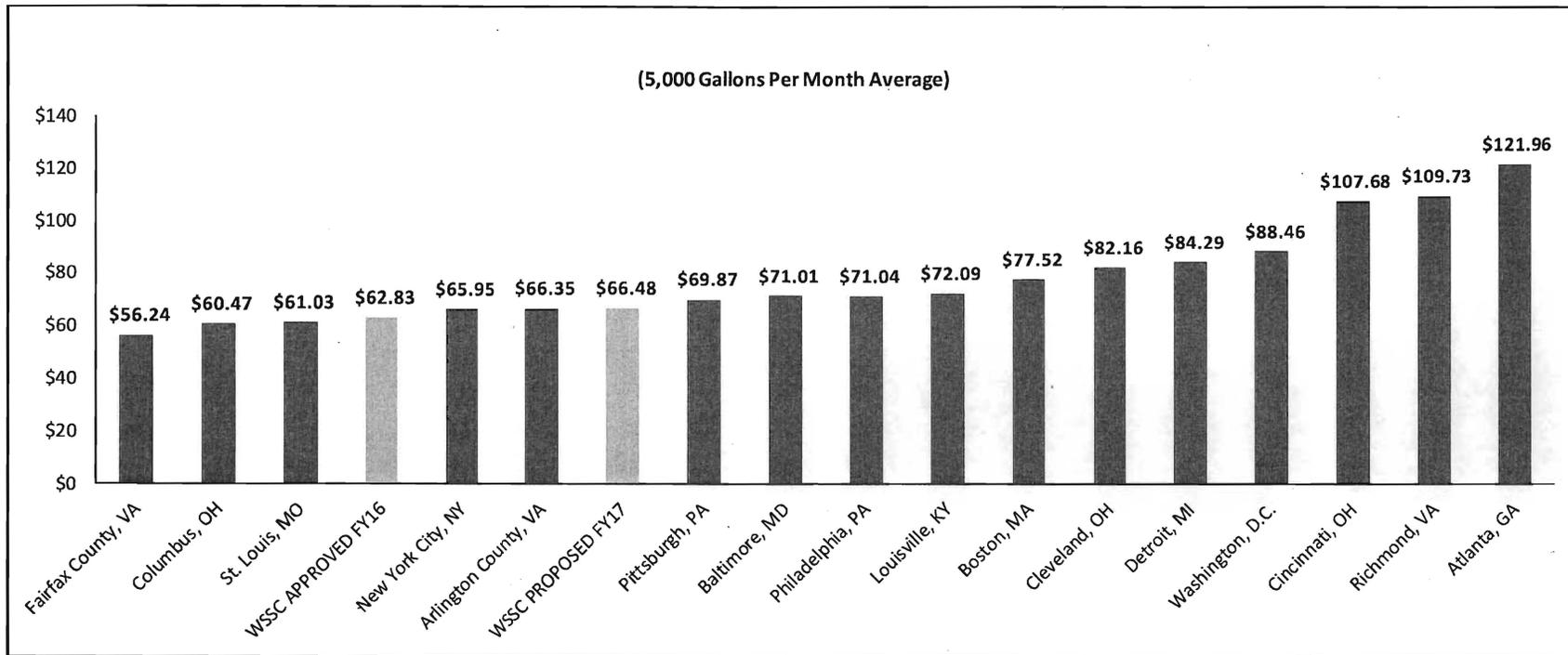
Affordability Comparison for Large Water Consumption (22,400 gal/month) Users



Findings:

- In general, WSSC's overall cost of service is reasonable and not out of line with other large utilities, especially those with consent decrees.
- For most WSSC customers, monthly bills are affordable in comparison: Average residential consumption is approximately 5,000 gallons per month.
- WSSC uses a maximum rate inverted conservation scale, where customers pay the highest rate for the average flow that ends up in that rate block.

FY 2016 RESIDENTIAL MONTHLY WATER/SEWER BILL COMPARISON

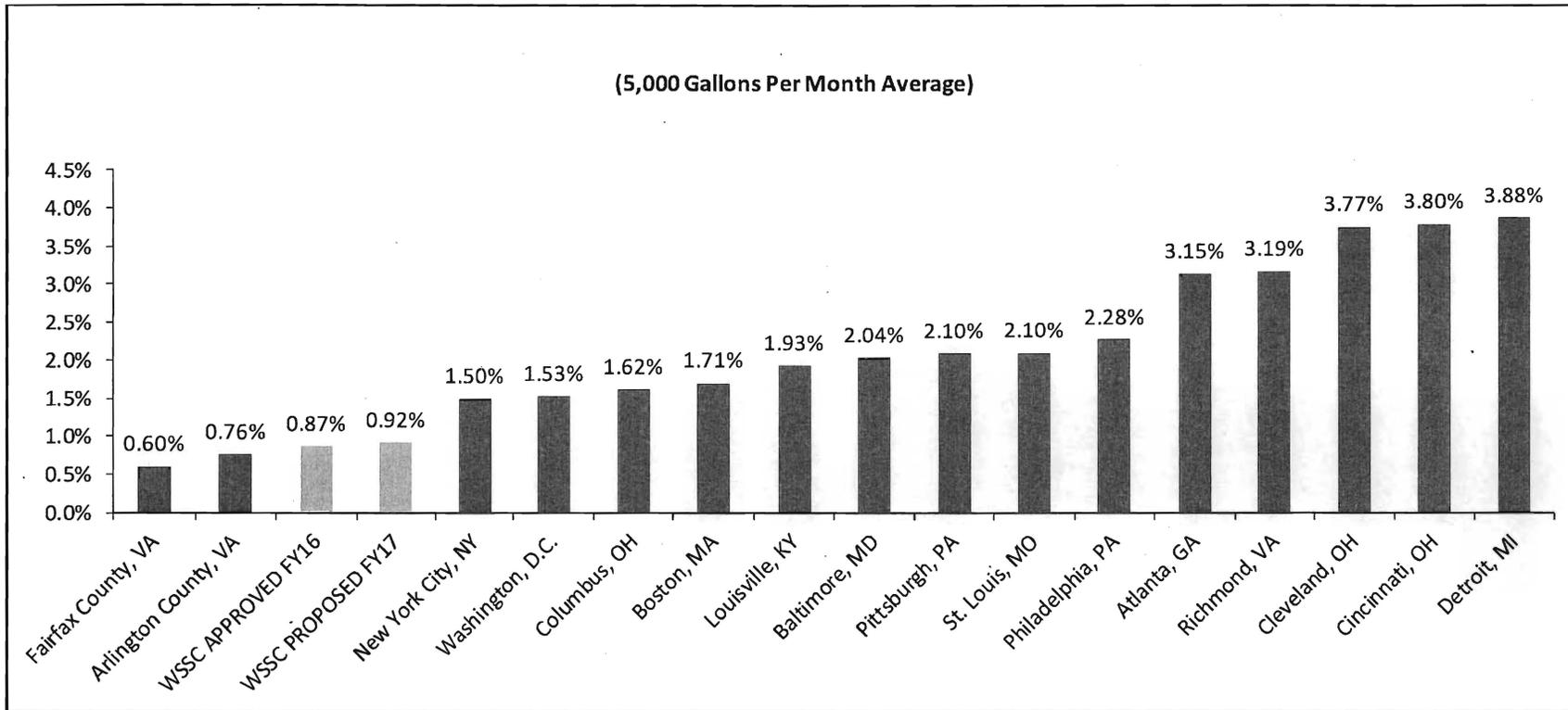


Presented is a comparison of WSSC's rates to other cities and communities, both nationally and locally, for residential customers using 5,000 gallons of water per month. The rates used in this comparison were in effect in November 2015 at the time of this analysis. The chart includes WSSC bills at FY'16 approved and FY'17 proposed rates.

From FY17 WSSC Proposed Budget

34

AVERAGE MONTHLY BILL COMPARISON AS A PERCENTAGE OF MEDIAN INCOME



From FY17 WSSC Proposed Budget

Median household income (in 2014 dollars) 2010-2014. (Source: www.census.gov)

35